IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of: : Examiner: Kenneth Tang

       Rudi MAYER et al.   :

For: CONTROL UNIT FOR A SYSTEM AND :
           A METHOD OF OPERATING A   :
           CONTROL UNIT   :
                                 : Art Unit: 2127

Filed: July 17, 1998   :

Serial No.: 09/118,234   :

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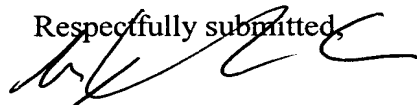
SIR:

      Transmitted herewith for filing in the above-identified patent application please find an Appeal Brief pursuant to 37 C.F.R. § 1.192(a), in triplicate.
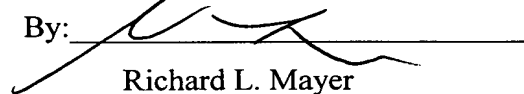
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                               Respectfully submitted,

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APPEAL BRIEF PURSUANT TO 37 C.F.R. § 1.192(a)

SIR:

      On August 4, 2003, the U.S. Patent and Trademark Office (the "PTO")
received Appellants' Notice of Appeal from the final rejection of claims 1-14 contained in
the Final Office Action issued by the U.S. Patent and Trademark Office (the "PTO") on
May 7, 2003 in the above-identified patent application.

      In accordance with 37 C.F.R. § 1.192(a), this brief is submitted in triplicate in
support of the appeal of the final rejection of claims 1-14. For at least the reasons set forth
below, the final rejection of claims 1-14 should be reversed.

1.   REAL PARTY IN INTEREST

      The real party in interest in the present appeal is Robert Bosch GmbH,
Postfach 30 02 20, D-70442 Stuttgart, Federal Republic of Germany. Robert Bosch
GmbH is the assignee of the entire right, title, and interest in the present application.

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2.   RELATED APPEALS AND INTERFERENCES

There are no interferences or other appeals related to the present application.

3.   STATUS OF CLAIMS

Claims 1, 3-7, 9-10, and 12-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,070,453 to Duffany (the "Duffany patent"). Claims 2, 8, and 11 stand rejected under 35 U.S.C. § 103(a) as being obvious over the Duffany patent in view of U.S. Patent No. 4,437,342 to Hosaka et al. (the "Hosaka patent").

Appellants appeal from the final rejection of claims 1-14. A copy of all of the pending claims is attached hereto in the Appendix.

4.   STATUS OF AMENDMENTS

An Amendment was submitted subsequent to the final rejection in the present application that included an amendment to claim 10. The Examiner indicated in the Advisory Action of July 7, 2003 that the amendment has been entered.

5.   SUMMARY OF THE INVENTION

The present invention relates to a control unit for a system that has a plurality of modules. An example embodiment of the present invention is illustrated in Figure 1. Figure 1 shows a control unit 1 that includes a microprocessor 3 and processing modules 10, 11, 12. Specification at page 2, lines 19-20. Processing modules 10, 11, 12 include a function module 10, a diagnostic module 11, and a scheduler 12. Specification at page 2, lines 20-22. Modules 10, 11, 12 may be program modules or hardware components. Specification at page 3, lines 6-8. Function modules 10 and diagnostic modules 11 may be in an active state or an inactive state, depending on the operating state of system 2. Specification at page 3, lines 27-28 and page 4, lines 3-5. In the inactive state, the functions associated with the modules 10, 11, such as diagnosis or control of parts of the system, are not performed. Specification at page 3, lines 28-29.

Individual function modules 10 or diagnostic modules 11 are activated by a sequence control that decides which function modules 10 or diagnostic modules 11 are to be executed. Specification at page 4, lines 5-7. Scheduler 12 is part of the sequence control and can make the activation of individual function modules 10 or diagnostic modules 11 dependent upon certain external conditions. Specification at page 4, lines 7-

10. Multiple function modules 10 and multiple diagnostic modules 11 can be processed in parallel, in the sense that the processing of one module is not yet concluded while another module is also being processed at the same time. Specification at page 4, lines 13-16.

Certain modules may supply faulty information if certain other modules are activated at the same time. Specification at page 4, lines 16-18. Figures 2 and 3 illustrate two exemplary embodiments of tables including information relating to the cross-dependencies and interferences between modules. Figure 2 indicates that state "X" is observed by program modules "A" and "B" and is interfered with by program module "C". Specification at page 5, lines 15-16. The information on the cross-dependencies is compiled centrally in a first storage device. Specification at page 1, lines 17-19. Additional modules can easily be added or removed since the mutual dependencies among the modules can be stored in the central storage. Specification at page 1, lines 19-21.

6. **ISSUES**

A. Whether claims 1, 3-7, 9-10, and 12-14, which stand rejected under 35 U.S.C. § 102(b), are patentable over the Duffany patent.

B. Whether claims 2, 8, and 11, which stand rejected under 35 U.S.C. § 103(a), are patentable over the Duffany patent in view of the Hosaka patent.

7. **GROUPING OF CLAIMS**

Issue A:

Group I:	1, 5, 6, 7, 9, 10, 14
Group II:	3, 12
Group III:	4, 13

With respect to Issue A, it is respectfully submitted that the claims within each group stand or fall with the other claims of that group. However, the claims of each group do not stand or fall with the claims of any other group.

Issue B:

With respect to Issue B, claims 2, 8 and 11 stand or fall together.

8.   ARGUMENTS

A.   Issue A

1.   Group I

Claims 1, 5, 6, 7, 9, 10, and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Duffany patent. It is respectfully submitted that the Duffany patent does not anticipate the aforementioned claims, for at least the following reasons.

Claim 1 relates to a control unit for a system. The control unit includes, *inter alia*:

> ... a second storage device for storing state information regarding the modules, the state information indicating which of the modules are currently activated; and
> a scheduler for activating at least one of the modules and determining as a function of the information stored in the first storage device and the information stored in the second storage device whether the mutual interference occurs if an additional module is activated, wherein the scheduler prevents a simultaneous activation of modules that interfere with each other.

The Examiner apparently asserts that program store 815, which apparently contains a sequence of instructions, and figures 3 and 8 of the Duffany patent, disclose the second storage device of claim 1. (Col. 5, ll. 28-30). The sequence of instructions is apparently adapted to control several elements (801, 805, and 820) in forming an optimum allocation signal. (Col. 5, ll. 28-32). It is respectfully submitted that the instruction sequence gives no indication of which, if any, of a group of modules is currently activated, as recited in claim 1. The instructions are merely program instructions. Even if the instructions in the flowchart of figure 3 do relate to states, as the Examiner suggests in section 5 of the Office Action on pages 7-8, and which is respectfully not conceded, there is no indication that any instructions therein relate to a current activation of a module. The instructions of figure 3 apparently relate to optimizing resource usage and a signal array generated to represent the interferences between tasks. (Col. 4, ll. 31-37). However, again there is no indication in the related text indicating that any information indicates whether a module is currently activated. Since the Duffany patent does not disclose, or even suggest, the recited second storage device for storing state information regarding the modules in which the state information indicates which of the modules are currently activated, the Duffany patent does not anticipate the subject matter of claim 1.

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Additionally, there is no disclosure in the Duffany patent of a scheduler for activating at least one of the modules and determining as a function of the information stored in the first storage device and the information stored in the second storage device whether the mutual interference occurs if an additional module is activated. The Office Action asserts that "task scheduling is performed in the control unit 920 in accordance with the invention to optimize the data transfers among processors ...." Office Action at page 3, ll. 15-16). However, there is no indication in the Duffany patent of determining whether mutual interference occurs if an additional module is activated. In particular, the Duffany patent apparently addresses the situation of a static set of tasks and determining resource allocation based on the static set of tasks ("FIG. 1 is a generalized flowchart illustrative of the invention that is adapted to provide optimum usage for a process involving a set of task and a set of resources." Col. 2, ll. 66-68.). There is no indication in the Duffany patent of a changing set of tasks, and therefore there is no discussion relating to activation of an additional module. Since the Duffany patent does not disclose a scheduler that is capable of addressing the situation of additional modules and their corresponding mutual interferences, the Duffany patent does not anticipate the subject matter of claim 1.

Claims 5, 6, 7, and 9 depend from claim 1 and are therefore allowable for at least the same reasons as claim 1 is allowable.

Claim 10 relates to a method of operating a control unit of a system. The method includes, *inter alia*:

> ... providing a second storage device storing state information regarding the modules, the state information indicating which of the modules are currently activated;
>> before an activation of an additional module is performed, determining as a function of the information stored in the first storage device and the information stored in the second storage device whether the mutual interference occurs if the additional module is activated; and
>> preventing a simultaneous activation of modules that interfere with each other.

As noted above with respect to claim 1, the Duffany patent does not disclose, or even suggest, a second storage device storing state information indicating which of the modules are currently activated. The Duffany patent also does not disclose, or even

suggest, determining whether the mutual interference occurs if an additional module is activated. Therefore, the Duffany patent does not anticipate the subject matter of claim 10.

Claim 14 depends from claim 10 and is therefore allowable for at least the same reasons as claim 10 is allowable.

It is therefore respectfully submitted that the Duffany patent does not anticipate claims 1 and 10, or any of the claims that depend therefrom. Reversal of the Examiner's rejection of claims 1, 5, 6, 7, 9, 10, and 14 under 35 U.S.C. § 102(b) is therefore requested.

2. Group II

Claim 3 depends from claim 1, and is therefore allowable for at least the same reasons as claim 1 is allowable. Additionally, claim 3 recites the additional feature that the scheduler prevents the simultaneous activation of modules that interfere with each other by preventing an activation of the additional module.

The Duffany patent does not disclose, or even suggest, preventing an activation of an additional module, as recited in claim 3. The Office Action asserts that these features are disclosed by a variety of sections of the Duffany patent. Office Action at page 4, ll. 4-10. However, the cited sections do not disclose, or even suggest, preventing an activation of an additional module.

Claim 12 depends from claim 10, and is therefore allowable for at least the same reasons as claim 10 is allowable. Additionally, claim 12 recites the additional feature that the preventing of the simultaneous activation of modules that interfere with each other includes the step of preventing an activation of the additional module. As noted above, the sections of the Duffany patent cited in the Office Action fail to disclose, or even suggest, preventing an activation of an additional module.

In view of the foregoing, it is respectfully submitted that the Duffany patent does not anticipate either of claims 3 or 12. Reversal of the Examiner's rejection of claims 3 and 12 under 35 U.S.C. § 102(b) is therefore requested.

3. Group III

Claim 4 depends from claim 1 and is therefore allowable for at least the same reasons as claim 1 is allowable. Additionally, claim 4 recites the additional feature that

the scheduler prevents the simultaneous activation of modules that interfere with each other by interrupting an activated module and activating the additional module after the activated module is interrupted.

The Duffany patent does not disclose, or even suggest, interrupting an activated module, as recited in claim 4. The Office Action asserts that these features are disclosed by a variety of sections of the Duffany patent. Office Action at page 4, ll. 12-21. However, none of the cited sections discloses, or even suggests, interrupting an activated module.

Claim 13 depends from claim 10, and is therefore allowable for at least the same reasons as claim 10 is allowable. Additionally, claim 13 recites the additional feature that preventing of the simultaneous activation of modules that interfere with each other includes the steps of interrupting an activated module and activating the additional module after the activated module is interrupted. As noted above, the sections of the Duffany patent cited by the Office Action fail to disclose, or even suggest, interrupting an activated module and activating the additional module after the activated module is interrupted.

In view of the foregoing, it is respectfully submitted that the Duffany patent does not anticipate either of claims 4 and 13. Reversal of the Examiner's rejection of claims 4 and 13 under 35 U.S.C. § 102(b) is therefore requested.

B.   Issue B

Claims 2, 8 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Duffany patent in view of the Hosaka patent. Appellants respectfully submit that the combination of the references does not render the aforementioned claims unpatentable for at least the following reasons.

Claims 2 and 8 depends from claim 1. Accordingly, the arguments presented above in connection with claim 1 and the Duffany patent apply equally to claims 2 and 8. The Hosaka patent does not cure the deficiencies of the Duffany patent.

Claim 11 depends from claim 10. Accordingly, the arguments presented above in connection with claim 10 and the Duffany patent apply equally to claim 11. The Hosaka patent does not cure the deficiencies of the Duffany patent.

Moreover, there is no suggestion in the prior art to combine the Duffany patent and the Hosaka patent.

In view of the foregoing, it is respectfully submitted that the Duffany patent in view of the Hosaka patent does not render obvious any of claims 2, 8 or 11. Reversal of the Examiner's rejection of claims 2, 8 and 11 under 35 U.S.C. § 103 as being obvious over the Duffany patent in view of the Hosaka patent is therefore requested.

9.   CONCLUSION

For at least the reasons indicated above, Appellants respectfully submit that the art of record does not render unpatentable Appellants' invention as recited in the claims of the above-identified application. Accordingly, it is respectfully submitted that the invention recited in the claims of the present application is new, non-obvious and useful. Reversal of the Examiner's rejections of the claims is therefore respectfully requested.

Respectfully submitted,

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APPENDIX

1. A control unit for a system having a plurality of activatable modules for generating information as a function of at least one of a plurality of states of the system, comprising:

a first storage device for storing information relating to a mutual interference of the modules;

a second storage device for storing state information regarding the modules, the state information indicating which of the modules are currently activated; and

a scheduler for activating at least one of the modules and determining as a function of the information stored in the first storage device and the information stored in the second storage device whether the mutual interference occurs if an additional module is activated, wherein the scheduler prevents a simultaneous activation of modules that interfere with each other.

2. The control unit according to claim 1, wherein the system includes one of a motor vehicle, an engine, and a transmission.

3. The control unit according to claim 1, wherein the scheduler prevents the simultaneous activation of modules that interfere with each other by preventing an activation of the additional module.

4. The control unit according to claim 1, wherein the scheduler prevents the simultaneous activation of modules that interfere with each other by interrupting an activated module and activating the additional module after the activated module is interrupted.

5. The control unit according to claim 1, wherein the first storage device stores information regarding which modules interfere with one another when they are simultaneously activated.

6. The control unit according to claim 1, wherein the first storage device stores information regarding which states of the system correspond to which activated modules and which states of the system are interfered with by which activated modules.

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7. The control unit according to claim 1, wherein each one of the modules and the scheduler includes a program to be processed by a microprocessor.

8. The control unit according to claim 1, wherein each one of the first storage device and the second storage device includes one of a plurality of tables and a plurality of matrices.

9. The control unit according to claim 1, wherein one of a set of functions appearing to a user as one unit and another set of functions being used to control a uniform function is divided into the modules and are managed separately by the scheduler.

10. A method of operating a control unit of a system for activating at least one of a plurality of modules in order to generate information regarding at least one of a plurality of states of the system, comprising the steps of:

    providing a first storage device for storing information relating to a mutual interference of the modules;

    providing a second storage device storing state information regarding the modules, the state information indicating which of the modules are currently activated;

    before an activation of an additional module is performed, determining as a function of the information stored in the first storage device and the information stored in the second storage device whether the mutual interference occurs if the additional module is activated; and

    preventing a simultaneous activation of modules that interfere with each other.

11. The method according to claim 10, wherein the system includes one of a motor vehicle, an engine, and a transmission.

12.   The method according to claim 10, wherein the step of preventing the simultaneous activation of modules that interfere with each other includes the step of preventing an activation of the additional module.

13.   The method according to claim 10, wherein the step of preventing the simultaneous activation of modules that interfere with each other includes the steps of

interrupting an activated module and activating the additional module after the activated module is interrupted.

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14.   The method according to claim 10, wherein the steps of the method are executed by a program to be processed by a microprocessor.